# OBESITY

## *Its Types and Treatment*

# IN PERSISTENT PAIN

the demand for relief is oftentimes so urgent that the first thought is of a hypodermic injection of morphine—and yet every doctor holds back on account of its dangerous possibilities.

# PAPINE

(BATTLE)

is an anodyne that may be fully relied upon to give relief in pain with complete avoidance of the evil psychical influence of the hypodermic injection. The patient gets relief with a minimum of possibility of habit-formation.

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*What More Could You Ask of an Anodyne?*

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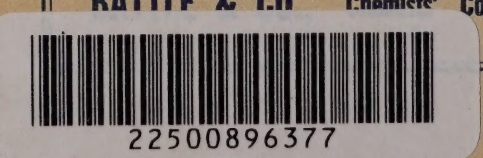

The putting on of fat is not quite the simple, obvious matter that the average layman thinks it is. Certainly it is not always a case of the more one eats the fatter one becomes; nor even altogether of **what** one eats. Indeed, everyone knows that some people can seemingly eat anything they please, and all they please, without getting fat, while others seem to put on flesh under the most abstemious and carefully selected diet. It is quite evident that the diet alone is not the be-all and end-all of getting fat or thin.

This truth has been borne in on the public during the last few years, thanks to the social ascendancy of the slender figure and the consequent furore among women for "reducing." It is recognized that some people grow fat and some grow thin on the self-same diet, or with no special diet at all. Now, if those who have a tendency to obesity can be led a step further, and made to understand that the tendency itself is not a single, simple thing, the same in every case, but a variety of possible conditions, they will have made a long stride toward meeting the situation rationally and successfully. And it is the physician's part to promote this intelligent understanding.

## TYPES OF OBESITY

However much it may seem that the matter of being fat or thin is a mere accident, this is not really the case. There is a cause somewhere; and there are quite a number of possible causes for obesity aside from the kind and quantity of food consumed. In general, people who show a marked tendency to put on fat can be divided into three main classes:

1. Those in whom it is sheerly a matter of over-eating, especially of the fat-producing foods, and under-exercising.

2. Those whose metabolic mechanism is definitely faulty because of some biological condition of one or other of the endocrine glands.

3. Those who are suffering from some actual disease which affects metabolism.

It must be admitted that many of the first group really belong in the second. The very fact of their inactivity is often a sign of some endocrine abnormality. They prob-



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ably lack one of the endocrine principles which stimulate activity, and so indirectly their obesity is the result of that biological handicap. But their endocrine defect has no direct influence on their metabolism, and even if they cannot bring themselves to take proper exercise they have only to adjust their intake of food to the small demands of their inactive bodies in order to keep themselves in reasonable condition.

Many of this class, to be sure, do not really want to be helped; not to the extent of helping themselves. They lazily wish they were not so fat; and they talk a great deal about "going to reduce." But they are too fond of eating to make any serious attempts in that direction. These are the people who, above all others, credulously swallow every "obesity remedy" which promises to reduce their fat without the effort of exercising or the sacrifice of any of the pleasures of the table.

The second group, while they are not so numerous, constitute one of the real problems of obesity. They are the most in need of scientific help, as they are the most disappointed victims of unscientific exploitation. They are genuinely anxious to lose their fat, and willing to undergo almost any effort and discomfort to attain their end. And in most instances they find, to their sorrow, that the moment they let up in their efforts they slip back into their fattening propensities, or even thrive on the very methods by which they hoped to reduce.

Lastly, there is the third group, happily not very numerous. There are certain chronic diseases which have a direct and profound disturbing influence upon metabolism, causing the accumulation and deposition of fat,—notably diabetes, of which this is often one of the earlier symptoms. Manifestly it is not only foolish, but positively dangerous, for such a person to undertake the strenuous dietaries and exercises by which most people in such a case attempt to reduce.

All three of these factors have to be taken into consideration in explaining and dealing with a case of obesity. And in reality they are not only three, but legion; for in the second and third groups, at all events, there are sev-

eral possible causes for the disturbance in metabolism, each acting in its own particular way, and each demanding different treatment.

## SIMPLE OBESITY

How can we differentiate between a case of simple obesity, due to taking an excess of food over body requirements, or what amounts to the same thing, a lack of sufficient exercise to oxidise the food, and one which is the result of some abnormal metabolic condition? For that, of course, is the first point to be determined before instituting any rational measures for reducing.

There is one factor which, as a rule, settles this question quickly and definitely, namely, the basal metabolism. The metabolic process in the body may be likened to the manufacturing operations in a factory. In the case of simple over-eating there is no particular hurry-up or slow-down in the factory. It is merely that a certain proportion of the manufactured product is not shipped out, and used as fast as it is made, but is stored within the premises. This may not be an exactly accurate statement of the case, but it is approximately so. At all events there is no fundamental alteration in the rate at which combustion takes place, and it is the combustion process which generates most of the heat of the body. Therefore, in simple obesity there is no marked variation from the normal basal metabolism.

It is pretty safe to say that, everything else being equal, a person who develops obesity and who gives a normal basal metabolism test is a simple case of over-eating and under-exercising.

This does not, of course, dispose of the whole matter of food intake. It does not follow that the total quantity of food consumed each day is too great. That daily total may be actually less than the amount consumed by another person who is growing thin. It signifies only that of one's total daily intake there is too great a proportion of energy-producing foodstuffs for his requirements. Fat contains twice as much calorie value as carbohydrate, weight for weight, and protein considerably more. If, therefore, one is eating a large proportion of fats and proteins, his total

diet may be relatively small and still he is taking in an excessive number of calories.

## TREATMENT

There are, naturally, two steps in the management of a case of simple obesity. First, to "reduce," i. e., to decrease the amount of fat already in the body to something like a normal point. Second, to maintain the body weight and bulk at that point.

If the body be deprived of its intake of food it will begin to use up its storage reserve of fat. It is by this means that reduction is brought about. It would seem, then, that all that is necessary in a case of simple obesity is to stop eating until the body weight is somewhere near normal. This, however, is not practicable for at least two good reasons. In the first place, the body draws on its reserves only for heat and energy, and not to replace wear and tear of its tissues, which has to be provided for even during a reduction course. In the second place, under such a complete deprivation of food reduction takes place too rapidly, to say nothing of the lack of mineral salts and vitamines. To which must be added the danger of acidosis.

It is generally agreed among experts that for ordinary cases of obesity a loss of about 2 lbs. a week is sufficiently rapid reduction. If the overweight is great, it may be a little faster, at least for the first few weeks, after which it is best to slow up to 2 lbs. per week.

We may figure that for every 270 calories that we withhold from the diet the body will use up 1 oz. of its stored fat. If, then, we withhold 1,000 calories, i. e., if we feed a daily diet which is 1,000 calories short of the body requirements, the body will use up approximately 4 ozs., of its own fat per day to make up for the shortage. And this, multiplied by 7, brings about approximately the rate of reduction we want, namely, 28 ozs., or nearly 2 lbs. per week.

The basis of the calculation is the metabolism test. Suppose that this shows a twenty-four hour output (rest-

ing) of 1650 calories in a woman weighing 180 lbs. This is about normal. Suppose, further, that she is engaged in the ordinary activities of a housewife, which may be estimated to call for another 700 calories. The daily requirement in this case is 2350 calories. By feeding a diet which furnishes only 1350 calories we shall effect the desired reduction of 2 lbs. per week.

If the woman lives, as such women often do, a very inactive life, 700 calories would be too much to allow for it. 400 calories would be ample, making a total daily requirement of 2050 calories. If, on the contrary, the obese person is an outdoor laboring man, considerably more calories must be allowed for his activities, often amounting to a total of 3200 to 3500 calories per day. But whatever the daily total, a diet which furnished 1,000 calories less will bring about the desired rate of reduction.

The initial diet will only be an approximate one, anyway, to be tried out and checked up by experience, and adjusted accordingly. With every 10 lb. loss there will be a decrease of approximately 100 calories in the daily requirements, which must also be reckoned with in adjusting the reducing diet. The weight should be checked at least once a week, and it is a good plan to have an occasional metabolism test.

## APPORTIONMENT OF FOODSTUFFS

Since it is chiefly from the fats and carbohydrates that the body derives its overweight, these are the foodstuffs which should be principally withheld from the reducing diet. That is to say, the 1,000 daily calories which we propose to withhold should for the most part be in fats and carbohydrates. The proteins may be cut down somewhat, too, but proportionately the quantity of proteins should be larger, the more we reduce the fats and carbohydrates, so that the body may not lose any of its necessary tissues by failure to replace wear and tear.

There is another reason also for feeding a fairly good quantity of proteins, and that is that in addition to its food value protein exercises a certain dynamic influence upon the processes of metabolism and nutrition, which is highly important to health.

This does not mean that the amount of protein in the diet should be indiscriminately large, as some reducing diets provide. Ordinarily, a daily protein intake of 100 to 120 grams, according to the weight of the individual, is about sufficient for nutritional purposes. In young and vigorous individuals this may be taken principally in the form of meats; in older persons, or those who are not so robust, it is better that a good share of it be taken in the form of milk, cheese, eggs, etc.

In the case of obese persons otherwise normal and healthy the adjustment of the diet so as to provide the proper calorie supply in suitable apportionment, and an adequate supply of salts and vitamines, will suffice to bring about the desired result. It must be remembered, however, that many victims of obesity, especially among the middle-aged, suffer from chronic ailments, mild or severe, and from personal idiosyncrasies, which prevent them from properly digesting and assimilating certain articles of food. Bilious people, for example, with gall bladder troubles, cannot eat rich foods, or even starches in any great quantities. Those with bad hearts cannot, or should not, take large quantities of fluid. Some folks do not tolerate acids. And so on.

All of these factors must be taken into account in arranging a reducing diet, which sometimes makes it a rather nice, complicated task. Since they do not pertain to obesity, per se, they cannot be discussed at length here. Nevertheless, they relate very importantly to the dieting of obesity, and must be reckoned with in formulating a reducing diet.

## EXERCISE

The reducing value of exercise, especially of artificially imposed exercises, has been greatly over-rated. Many obese persons risk straining their hearts by strenuous exercise. Moreover, exercise increases the demand and desire for food, and so helps to defeat the object of dieting. Particularly during the period of actual reducing, it is well to go lightly on exercising, until a certain degree of reduction has been attained, and one is sure of the patient's powers of endurance. If the heart is known to be weak, this is all the more imperative.

After reduction has been accomplished, and the body has become accustomed to its normal weight and bulk, even then one should simply engage in the ordinary activities of his daily life, adding, if the habits be sedentary, a reasonable amount of outdoor exercise.

## MASSAGE

Properly performed, massage is of some accessory value in getting rid of superfluous flesh. But it is not to be expected that massage, by and of itself, will take the place of a suitably adjusted diet, or of normal active exercise. As an adjunct to both, it is useful, especially in inactive persons. And for those who are incapacitated from active exercise it is the next best alternative. But, as stated, it will hardly keep pace with the deposition of fat which takes place under an excessive intake of fat-making foods.

## WATER DRINKING

The question of water drinking in obesity is rather a problematical one. Water is of course a necessary factor in metabolism and nutrition, since all the food products manufactured in the body have to be put into solution in order to be absorbed and assimilated. It is also true that most food contain large percentages of water, so that when one eats he also drinks. But the body requires considerably more water than is contained in solid, or even semi-solid foods, and it is necessary to take in daily quantities of water sufficient to maintain normal health and nutrition.

Whether a person who is reducing should restrict his water drinking, or whether it will materially help his reduction if he does, is not always easy to say. Water helps particularly to break down the protein molecules; but it is difficult to predict whether this breaking down of the protein molecules will increase or diminish the body fat. If it is only partial, it may result in the formation of fat from the proteins; if carried further, it may lead to the destruction of fat as well. Moreover, it often seems that water, if taken in too large quantities, is retained in the body, increasing the bulk and weight.

On the whole, it is perhaps advisable for obese persons to keep the water ration within moderate limits during the period of actual reduction, and in cases of extreme overweight a considerable restriction of fluid may be desirable until the weight has been brought down quite noticeably. After reduction has been accomplished, and it is only a matter of keeping it down, there is probably no reason for any special restriction of water, and at least sufficient should be drunk each day to promote normal metabolism and elimination.

During reduction it is often a good plan to drink in moderation of some alkaline carbonated water. This is useful for two reasons: (1) It quenches the thirst in smaller quantities than plain water, and therefore enables one to get along with less fluid, and (2) It helps to keep down the acidity, and acts as a diuretic, thus aiding in getting rid of water from the body. The occasional use of alkaline saline water is useful, in that it acts as a cathartic and helps to eliminate through the bowels. A classification of these waters may be found in any of the Public Health publications on the subject.

Sodium bicarbonate (baking soda) is sometimes recommended and taken by those who wish to reduce. Undoubtedly it does have some reducing influence, but as its effect is probably due to the disturbance which it creates in digestion, it cannot be said to be a very good, or even safe, procedure.

## DRUGS

Drugs are not called for in the treatment of simple obesity. Where they are needed, there is something more at issue than mere over-eating or under-exercising. It is safe to say that there is no drug known to medical science which is indicated in the treatment of simple obesity, or which will bring about a reduction of fat in the body without at the same time imperiling, if not actually injuring, the health.

## CATHARTICS

The practice of taking cathartics is no more to be commended in obesity than in the case of other individuals.

It is true that the restriction of diet entailed in reducing has a tendency to cause constipation; but this should be met and overcome by a liberal allowance of green vegetables and fresh fruits. As stated above, the occasional taking of a saline water is permissible; but this is for the purpose of eliminating water rather than for catharsis. If artificial laxatives are required, such neutral laxatives as mineral oil and agar-agar are better than drug cathartics.

## BEST TIME TO REDUCE

The best time to practise reduction is during the winter. The reasons for this are: (1) The heat-energy output and calorie requirements are greater in cold weather, the total intake of food is larger, hence the 1,000 calories are subtracted and withheld from the total requirement the intake is still larger than in summer, providing amply for tissue repair and other vital processes. (2) One does not notice the monotony of the reducing diet, or rebel at it, as much in winter as in summer. The only thing against reducing in winter is the difficulty of procuring fresh green vegetables and fruits for supplying the body with salts and vitamines. However, in these days the difficulty is largely theoretical. These articles are shipped in from the South and Southwest and can be obtained from the stores all the year round. Many of them are canned in such a way as to preserve their vitamine content.

## BINDERS

When the reduction of weight is considerable, it is often advisable for the patient to wear an abdominal binder, or other form of support, to maintain the position and tension of the abdominal organs, which the abdominal muscles, weakened by obesity, may be incapable of doing.

## ACID AND ALKALINE FOODS

One of the important considerations in a reducing diet is the maintenance of the slightly alkaline balance in the body which is necessary to life and health. The accompanying tables, taken from an article by Drs. Sansum, Blatherwick and Smith, in the Journal of the American Medical Association, (Vol. 81, No. 11, page 883), give the principal foods which are predominantly acid and alkali producing, respectively:



*1923

TABLE 1—ACIDITY OF CERTAIN FOODS

| | Per hundred grams. | | Per hundred grams. |
|---|---|---|---|
| Bread, white | 2.7 | Meat, chicken | 17.01 |
| Bread, whole wheat | 3.0 | Meat, frog | 10.36 |
| Corn, sweet, dried | .95 | Meat, pork lean | 11.87 |
| Crackers | 7.81 | Meat, rabbit | 14.80 |
| Cranberries | * | Meat, veal | 13.52 |
| Eggs | 11.10 | Oysters | 30.00 |
| Egg white | 5.24 | Oat, meal | 12.93 |
| Egg yolk | 26.69 | Peanuts | 3.9 |
| Fish, haddock | 16.07 | Prunes, plums | * |
| Fish, pike | 11.81 | Rice | 8.1 |
| Meat, beef, lean | 13.91 | | |

TABLE 2—ALKALI-PRODUCING FOODS

| | | | |
|---|---|---|---|
| Almonds | 12.38 | Currants, dried | 5.97 |
| Apples | 3.76** | Lemons | 5.45 |
| Asparagus | .81 | Lettuce | 7.37 |
| Bananas | 5.56** | Milk, cow's | 2.37 |
| Beans, dried | 23.87 | Muskmelon | 7.47** |
| Beans, lima, dried | 41.65 | Oranges | 5.61** |
| Beets | 10.86 | Peaches | 5.04 |
| Cabbage | 4.34 | Peas, dried | 7.07 |
| Carrots | 10.82 | Potatoes | 7.19** |
| Cauliflower | 5.33 | Radishes | 2.87 |
| Celery | 7.78 | Raisins | 23.68 |
| Chestnuts | 7.42 | Turnips | 2.68 |

It will be observed from these that in the main eggs, fish, meats and oysters are the greatest acid-producing foods which enter into the dietary most commonly used.

*The ash of these foods is alkaline, but because of contained substances which form hippuric acid in the body, they increase the acidity of the urine.

**These foods have been found experimentally to be very efficient in reducing the acidity of the body.

## ENDOCRINE OBESITY

When, in a person who develops obesity, the basal metabolism test shows a marked abnormal rate, we are faced with quite a different state of affairs. As a general proposition, a high metabolism rate is attended by underweight, a low rate by overweight. The heat given off by the body, and which is measured by the test, is not generated in the preliminary digestion of the foodstuffs and their manufacture into finished products. In this manufacturing process, catabolism produces heat and anabolism absorbs it, so that the quantity of heat concerned prac-

tically balances itself. It is in the final combustion and breakdown of the finished products that the given-off heat is produced.

It is plain, therefore, that when the metabolism rate shows higher than normal, and an excessive amount of heat is given off, the body is breaking down more food-stuff than it is taking in, and losing weight. On the other hand, when the rate is abnormally low, and a deficient quantity of heat given off, it is burning up less than it is taking in, and is gaining weight. The loss or gain in these cases is irrespective of the quantity of food consumed. It is due to the rate at which the food-products are broken down; and that, in turn, is due to some abnormal body condition.

The first thing to be done, naturally, is to exclude the presence of an actual disease, like diabetes, which is a matter of ordinary diagnosis. What we are here concerned with is the importance of every person who finds himself becoming noticeably obese submitting, first, to a basal metabolism test, and then, if the test discloses an abnormal metabolic rate, undergoing a thorough medical examination before starting on any reducing measures.

## THYROID OBESITY

There is no question but that the thyroid is the commonest and most influential offender in the matter of endocrine obesity. An over-active thyroid is the most frequent cause of rapid metabolism and its consequent loss of weight; and an under-active thyroid is likewise the most frequent cause of slow metabolism with its resulting overweight.

Shortage of thyroid secretion, or poor, inactive secretion, can exhibit all degrees. In severe degrees, the resulting disturbance in metabolism amounts to a positive disease,—cretinism. In milder degrees there is no active disease, and whatever mental dullness there may be is simply the slight lethargy of a slow body nutrition. Usually in such cases the only, or the principal thing noticed by the patient is a tendency to put on flesh at the least provocation, or without any provocation at all.

The reason why a person with an inactive thyroid puts on flesh, and the way it operates, is comparatively simple, although, to be sure, there are plenty of details which are not yet understood. The thyroid is a potent stimulator of metabolism. Lacking its secretion, no matter how much food one eats, he burns and uses it much more slowly than normally, hence he never uses all that he takes in for heat and energy purposes. That which he fails to burn and utilize is manufactured into fat and stored in the body, adding to its bulk and weight.

If it be asked, "How can we know positively that of all the possible causes it is the thyroid that is at fault?" the answer is rather difficult. There may be certain other signs and symptoms, such as dryness of the skin, thinness of the hair, scanty menstruation (in women), and a tendency to mental dullness, which leads us to suspect the thyroid. But the only real and conclusive way of deciding the question is by means of the thyroid test.

## MANAGEMENT OF THYROID OBESITY

Reducing the intake of food, or even of the fats and carbohydrates, will naturally reduce the overweight of these persons, because when you cut down the total intake you necessarily cut down the proportion which remains unmetabolized and stored as fat. But the trouble with this plan is that, inasmuch as the patient is not metabolizing and using anything like what he takes in, if you reduce his intake to where he stores practically none you also cut down the portion that he uses far below his living requirements. Under such a dietary your obese patient will certainly lose weight, but his body will be so lacking in heat and energy, and in tissue replacement, that he will become ill, and perhaps die.

What we have to do first in these cases is to stimulate the metabolism to a point where it will oxidize the normal amount of fuel in twenty-four hours. And it is plain that in order to do this we must either find some way of making the thyroid more active or else supply the body with what it lacks in the way of thyroid principles.

One of the ingredients of thyroid secretion is iodine. Whether or not iodine is the thing by which the secretion

produces its stimulating effects upon metabolism is a much disputed question. Present-day research tends to show that it is not. But, at all events, by giving a person iodine we can produce much of the metabolic action of thyroid. By giving too much iodine, in fact we can produce the effect of an over-active thyroid, making the metabolism abnormally rapid and the patient thin. It is, therefore, a common practice to give people with thyroid obesity iodine, either in the form of a tincture or in the shape of an iodine salt with their food.

There are, however, two important provisos. First, we should be quite sure that the obesity is really due to a lack of thyroid activity, because otherwise the iodine will cause too rapid metabolism, which is not a pleasant, or even a safe, thing to have. Second, the dosage should be carefully regulated, for it requires very little iodine to do the trick, and it can very easily be overdone, with the same mischievous consequences just pointed out.

It must be confessed, however, that iodine often fails, and sometimes does worse than fail. The surer and more scientific way is to give the thyroid itself, either the thyroid substances or an extract of it. But, if iodine, given internally, needs careful regulation, so does thyroid substance or extract,—more so. It is the most rational and effective method of treating this form of obesity, but it must be given cautiously and under constant supervision, stopping it or reducing the dosage whenever any of the symptoms of over-dosage appear, such as palpitation, headache, muscle pains, tremors, nervousness, insomnia, nausea, etc.

The only sure way to determine the proper quantity of either iodine or thyroid for each individual is to ascertain, by test, the effect upon the basal metabolism rate, which should be done every week or so until the right amount of the drug has been arrived at. From then on, it is usually necessary for the patient to go on taking it indefinitely, with an occasional check-up by a basal metabolism test.

## DIET

The aim of the iodine or thyroid treatment is to increase the metabolism rate to where it burns up and uses a

normal quantity of foodstuffs, producing the normal number of body calories. That ideal goal is not always reached, or reachable. One can only approximate it. When it has been as nearly attained as possible it is necessary to adjust the total quantity of food, and ration the proteins, fats and carbohydrates to the best combination for the patient's needs.

In the main, the dieting procedure is about the same as in simple obesity, but with some differences. It must be remembered that we are not here dealing with a normal factory, overfed with raw material, which simply treats and turns out its normal output, storing the surplus. The situation here is a slow, inefficient factory, which cannot handle its normal, or even less than its normal, quantity of raw material. And even when we hurry it up it is still inefficient. In the first instance it is enough to adjust the intake of raw material to the normal output. In the second, the prime need is to furnish extra help; but even then we are far from having the equivalent of a normal, efficient force. The raw material must, so to speak, be selected so as to provide the easiest possible operating conditions.

The body can derive its heat and energy from any one of the foodstuffs; but they are derived most easily from the carbohydrates. Fats and proteins are the most likely to be unused and stored. If, therefore, we calculate the number of calories required for the patient's living needs, it is best to give a large proportion of them in carbohydrates. Sufficient protein, however, should be given to supply body waste, and to stimulate metabolism. As to fats, they should be kept down to the minimum.

After the metabolism rate has been brought up to approximately normal, the general course to be followed is practically the same as in simple obesity, namely, first to feed less than the required number of calories until the weight is reduced to the desired point, and then to adjust the diet so as to just maintain that weight. However, in thyroid cases it is not wise to reduce as rapidly as in the simple cases. It is better to withhold, say, 500 to 700 calories per day from the required allowance, always bear-

ing in mind that we are dealing with an inefficient body mechanism.

## PITUITARY OBESITY

Next in order to thyroid obesity, but much less common, is obesity due to disorders of the pituitary endocrine. It occurs both in children and in adults. In the former it is due principally to a deficiency in the posterior lobe of the pituitary gland; in the latter to a deficiency of both anterior and posterior lobes.

Pituitary obesity rarely develops in children before the fourth or fifth year of life. Overweight from birth is much more likely to be due to deficient thyroid than to any other endocrine disorder. This booklet is really not concerned with juvenile obesity, which is always so clearly a matter of biologic abnormality calling for medical aid that it hardly belongs in a discussion of obesity. It is mentioned here chiefly for the purpose of pointing out that even though it may cause but little incapacity in childhood it is likely to develop serious secondary defects at and after adolescence, which can be prevented only by proper diagnosis and prophylactic treatment before that period.

In adults, pituitary obesity usually develops around the age of twenty-four or twenty-five, and since, as stated, it usually involves defects of the front lobe of the gland, it produces an obesity of the trunk of the body which is characteristic. The fatness is most noticeable about the hip, rather than the upper part of the body. Moreover, it is commonly associated with disorders of the sex endocrines, causing maldevelopment of the generative organs and (in women) scanty or even suppressed menstrual flow. The woman who, at about the age of twenty-five, finds herself showing a tendency to scanty menstruation, combined with a rapid gain of weight in the girdle region, suggests very strongly a case of pituitary obesity. But, of course, there is always the possibility that the thyroid may also be at fault.

## TREATMENT

In cases where the pituitary endocrine is responsible for obesity the same principles of treatment apply as in the

thyroid cases. That is to say, theoretically, the lack of pituitary endocrine should be compensated for by giving pituitary internally until the metabolism rate is brought up to normal, and the diet adjusted to meet the caloric needs of the case. However, there is a good deal of question among medical authorities as to whether pituitary, or any other endocrine preparation except the thyroid, can be successfully given by the mouth so as to produce its characteristic effects upon metabolism.

Fortunately, cases of endocrine obesity other than those due to thyroid are comparatively rare. In any case, their diagnosis and differentiation are of such a nature as to be possible only to those skilled in endocrine practice.

## OTHER ENDOCRINES

It must be borne in mind that all the endocrines operate in mutual harmony, or in mutual antagonism with one another. A deficient thyroid, therefore, may not be altogether responsible for its own deficiencies. It may be working against an opposing endocrine which is too powerful for it. Or some other endocrine, which normally works in harmony with it, may also be deficient. The ovary (in females) is an example of this latter situation. We all know how, at middle age, when the ovaries slow up in their functioning, or after removal of the ovaries, a woman frequently begins to put on flesh. All these possibilities have to be reckoned with in treating endocrine obesity.

## DIABETIC OBESITY

The obesity which often accompanies diabetes is in reality a form of endocrine obesity. In fact, diabetes is itself an endocrine disease; that is to say, it is a disordered metabolism, due to defective functioning of the endocrine portion of the pancreas. Without insulin, it is impossible for the carbohydrates to be normally oxidised. When, therefore, the pancreas fails to secrete the proper quantity or quality of insulin, the body is unable to metabolize its normal quota of sugar, and diabetes results.

Not every diabetic patient puts on flesh. Many of them, indeed, are unusually lean and gaunt, especially in the later, severer stages of the disease. Joslin puts the case

the other way about, and says that diabetes occurs more frequently in persons who are heavier than normal for their height and age, which might indicate that the diabetes is somewhat due to obesity, or that the same metabolic disorder which causes the diabetes also causes the obesity. At any rate, the diabetic patient who becomes obese is usually the person who has a tendency to put on weight anyway, and is past middle age; and the obesity usually occurs at the beginning of the disease, and continues during the less severe stages.

Just why or how obesity occurs in diabetes at all is largely guesswork. The most obvious explanation would seem to be that since the carbohydrates are not burned in the body they are metabolized into fat and stored. This, to be sure, does not explain why some diabetics put on flesh and others do not. But neither are we able to say why some healthy persons get fat and others do not. As we have seen, some persons seem to have a tendency to fat deposition which others have not; and this factor is probably just as operative in diabetics as in healthy individuals. The failure to oxidize sugar in their bodies, due to lack of insulin, gives them the opportunity to store fat. In addition, the diabetic, whose tissues crave the sugar which they cannot use, has a marked appetite for carbohydrates, and, unless he is under a restricted diet, he eats heavily of these foodstuffs.

## TREATMENT

Strictly speaking, we are here concerned only with the management of diabetic obesity. However, just as with thyroid and pituitary obesity, so also with diabetic obesity, it is both useless and dangerous to simply direct our reducing measures to the matter of dieting. If the patient is over-eating, certainly his total intake should be cut down. But the all-important thing is that what he is eating, in the way of carbohydrates at all events, is not being properly metabolized; and it is to this that we must address ourselves.

In former days this was a more or less hopeless task, because we had no knowledge of what the metabolic defect actually was, let alone any means for remedying it. In

recent years, however, Dr. Banting and his colleague, Dr. Best, have not only demonstrated the secretion of the pancreas, which is responsible for carbohydrate oxidation (insulin), but have succeeded in isolating it and making a preparation of it, so that we are now able to give it to diabetic patients in the same way that we give thyroid preparations to thyroid patients, to supply the lack of it in their bodies.

Nowadays, then, the cardinal treatment of diabetes, and the first measure in the management of diabetic obesity, is to give the patient insulin, and to adjust the dosage so as to take care of the oxidation of a sufficient quantity of carbohydrates to maintain his calorific requirements. After that, the question of a suitable diet can be considered.

## DIET

The calculation of the number of calories needed to maintain life and health is the same for a diabetic as for any other individual. Having made the calculation, the essential thing is to determine whether the patient can take sufficient food to provide the necessary calories without having excessive sugar in the blood or in the urine. Before the discovery of insulin it was thought necessary to keep the urine free from sugar even though the caloric intake was far below the minimum requirements, which meant that the patient was gradually starved to death, unless some complication carried him off in the meantime. Nowadays, the administration of insulin permits persons with even a severe diabetes to eat sufficient food to maintain almost normal weight and strength. It is easy to see, however, that the adjustment of the diet hinges upon the dosage and effectiveness of the insulin, and is therefore a matter for individual determination.

The relative proportion of carbohydrate, protein and fat in the diet exercises a marked influence on the tolerance of the diabetic. Diets which contain a relatively large quantity of fat and a small amount of carbohydrate are better tolerated when the protein is low than when it is high. Reduction of the protein diminished the total sugar content of the diet, and also the dynamic action of the protein on metabolism. The dietary restrictions for ren-

dering the urine sugar-free vary with the severity of the disease. It is not well to institute a sudden complete fasting of carbohydrates, for fear of producing alarming acidosis. This is particularly true with obese people.

## ACIDOSIS

In the dietaries of diabetic obesity, more than in any other reducing diets, it is of the highest importance to avoid those foods which tend to produce excessive acidity in the body, since persons with diabetes are all prone to acidosis anyway.

At the first appearance of the symptoms of acidosis they should be given prompt attention, both in the regulation of their diet and otherwise. These early symptoms consist of unusual fatigue, lack of appetite, breathlessness, gastrointestinal acidity, nausea, vomiting, headache, aching in the muscles, sleepiness, flushed face, and a sweet, fruity odor of the breath. If not relieved, the condition is likely to go on to coma and death.

Whenever these symptoms appear in a diabetic patient, whether he is reducing or not, no time should be lost in instituting measures for their relief, and to check the process of acidosis. Such measures consist, principally, of two procedures: (1) The giving of an alkali, usually bicarbonate of soda, in sufficient quantities to restore the acid-alkali balance in the body, and (2) The readjustment of the diet so as to cut down the production of excessive acid. Considerable care and skill are necessary to determine the degree of acidity existing in the blood, to measure the alkaline reserve, and to adjust both the administration of sodium bicarbonate and the apportionment of the foods in the diet so as to meet the situation successfully.

By far the best plan is to anticipate the occurrence of acidosis, and to avoid it in advance by a proper adjustment of acid and alkali producing foods in the diet to start with. However, even in spite of the utmost precaution, acidosis will occasionally supervene, and when it does it should receive prompt and energetic attention.

Detailed dietaries for diabetics can be found in any of the authoritative works on diabetes or on dietetics.

## BROMIDIA

*Indications*—Sleeplessness, nervousness, neuralgia, headache, convulsions, colic, irritability, delirium of fevers, acute alcoholism, mania, epilepsy, drug addictions, etc.

*Dose*—One-half to one fluid drachm in water or syrup every hour until sleep is produced. It is inadvisable to administer more than three fluid drachms in twenty-four hours except under medical supervision. Bromidia should be given to patients under conditions favorable to its action, *viz.*, in bed or reclining in a quiet, darkened room.

## PAPINE

*Indications*—The same as opium or morphine, with less tendency to cause nausea, vomiting and constipation. Insomnia due to actual pain as distinguished from that due to irritability of the nervous system, which calls for Bromidia. A useful adjunct in cough mixtures. A safe opiate for children.

*Dose*—For adults, one fluid drachm pure. For children under one year, 2 to 10 minims. Papine should only be administered in accordance with medical directions.

*Requests for PAPINE must be accompanied by Federal narcotic order form.*

## ECTHOL

*Indications*—In all breaking down conditions of the fluids, tissues and corpuscles, dyscrasias of the secretions, blood poisoning or tissue disintegration. In typhoid, eruptive fever, smallpox, erysipelas, carbuncles, boils, gangrenous wounds, ulcers, abscesses, stings of insects, snakebite. Valuable as a local application in all pustular formations, fresh cuts and infected wounds.

*Dose*—Internal: A teaspoonful every 2, 3, or 4 hours, preferably after food.

External: Diluted with 2 to 10 parts of boiled water, or if necessary full strength.

## IODIA

*Indications*—Syphilis, hereditary or acquired, scrofulous and glandular ailments, gouty and rheumatic disorders, skin affections, chronic diseases of women, and whenever a safe, effective and reliable tonic alterative is required.

*Dose*—Two teaspoonfuls three times a day, before meals.

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